

# Prostate Cancer



# 2002

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# Prostate Cancer in Texas, 2002

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*Prostate Cancer  
was the most  
common type of  
invasive cancer  
diagnosed in men.*



*African Americans  
had the highest  
incidence of  
prostate cancer.*



## ***Prostate Cancer Incidence***

### ***Prostate Cancer Incidence, 1995–1998***

Of the 37,312 male cancers diagnosed annually in Texas during 1995-1998, prostate cancer was the most common. Prostate cancer accounted for 27.2% of all cancers among this group, with an average of 10,133 newly diagnosed cases per year (Figure 1). The overall average annual age-adjusted prostate cancer incidence rate for males of all races combined was 127.5 per 100,000 men.

### ***Prostate Cancer Incidence by Race/Ethnicity, 1995–1998***

Prostate cancer was the most common cancer among males in each individual race/ethnic group. African American males in Texas had the highest incidence of prostate cancer (Figure 2). The age-adjusted incidence rate for African American men in Texas (190.8 per 100,000 men) was over twice the rate for Hispanics (87.1 per 100,000 men), and almost 50 percent higher than the rate for non-Hispanic white men (130.3 per 100,000 men). African American men throughout the United States experience the highest prostate cancer incidence rates of any racial/ethnic group.<sup>1</sup>

### ***Prostate Cancer Incidence by Age & Race/Ethnicity, 1995–1998***

Of the 10,133 average annual cases of prostate cancer diagnosed among Texas males from 1995-1998, 9,465 (93.4%) were diagnosed in men 55 years of age

or older, confirming that prostate cancer is primarily a disease of older men (Table 1). Prostate cancer is almost nonexistent until the age of 45, after which the incidence rate rises exponentially with age. This pattern is apparent in all three race/ethnicity sub groups (Figure 3). The highest rates of prostate cancer occur among African American males in every age group.

Over 70 percent of men are age 65 or older at the time of diagnosis. Average annual age-adjusted prostate cancer incidence rate for males under 65 for all races combined was 43.7 per 100,000 men. Average annual age-adjusted prostate cancer incidence rate for males 65 and older for all races combined was 892.6 per 100,000 men.

### ***Prostate Cancer Incidence by Regional Councils of Government, 1995–1998***

Comparisons of prostate cancer incidence by Councils of Government (COG) with statewide rates revealed several regional differences. For all races combined, statistically significantly increased prostate cancer incidence occurred in the Ark-Tex (5), Brazos Valley (13), & Houston-Galveston (16) COGs. Significantly lower prostate cancer incidence was seen in South Plains (2), Nortex (3), Permian Basin (9), South Texas (19) and Middle Rio Grande (24) COGs (Figure 4).

For non-Hispanic whites, Brazos Valley (13), Alamo Area (18) and the Lower Rio Grande Valley (21) had significantly higher prostate cancer incidence rates compared

to Texas non-Hispanic whites. The South Plains (2), Nortex (3), North Central (4), and Permian Basin (9) COGs had significantly lower prostate cancer incidence when compared to statewide rates (Figure 5).

Among Hispanics, the Rio Grande (8) COG had significantly higher prostate cancer incidence compared to Hispanics statewide. The North Central Texas (4), Heart of Texas (11) and Houston-Galveston (16) COGs had significantly lower Hispanic prostate cancer incidence (Figure 6).

For African Americans, the Ark-Tex (5) and Alamo Area (18) COGs had significantly higher prostate cancer incidence compared to African Americans statewide, while no COGs had significantly lower prostate cancer incidence (Figure 7).

The reasons for the regional variations are not known, but may be the result of screening disparities or differences in the completeness of prostate cancer reporting in the various regions.

*Prostate Cancer Incidence Compared with California and the U.S. (Texas, 1995–1998; California, 1994–1998; U.S., Surveillance Epidemiology and End Results (SEER), 1994–1998)*

Incidence rates for prostate cancer were lower in Texas men as compared to California and U.S. SEER (Figure 8) for Hispanic and African American men, as well as all races combined.<sup>2, 3, 4</sup> For non-Hispanic white males, the Texas prostate cancer incidence rate was

statistically significantly higher than the California rate, but lower than the U.S. SEER rate. The rate ratios of prostate cancer incidence for Texas Hispanics and African Americans were statistically significantly lower than the California comparison population. These differences may represent under reporting of prostate cancer in Texas minority males (Table 2).

## **Prostate Cancer Mortality**

### *Prostate Cancer Mortality in Texas, 1990–1999*

Prostate cancer was the second leading cause of cancer deaths among Texas males for the years 1990-1999, with an average of 1,881 deaths each year, surpassed only by lung cancer with 5,686 average deaths per year. Prostate cancer accounted for approximately 11.3 percent of the total cancer deaths (Figure 9). The age-adjusted prostate cancer mortality rate for Texas males, all races combined, was 24.5 per 100,000 men.

### *Prostate Cancer Mortality by Race/Ethnicity, 1990–1999*

Among Texas race/ethnic groups, African American men had the highest age-adjusted prostate cancer mortality rate (54.1 per 100,000), which was over three times that of Hispanic men (16.3 per 100,000), and over twice that of non-Hispanic whites (23.2 per 100,000). The age-adjusted prostate mortality rate for African Americans in Texas is 2.2 times the rate for all races combined (Figure 10).

***Prostate Cancer was the second leading cause of cancer deaths.***



***African American men had the highest prostate cancer mortality rate.***



*From 1990 -1999,  
91% of prostate  
cancer deaths  
were among men  
65 years of age  
and older.*



*The highest rates  
of prostate  
cancer deaths  
occurred among  
African American  
males in every  
age group.*



3

### *Prostate Cancer Mortality by Age & Race/Ethnicity, 1990–1999*

Of the 1,881 average annual prostate cancer deaths among Texas males from 1990-1999, 1,718 (91%) were among men 65 years of age and over (Table 3). In all three racial/ethnic groups, prostate cancer mortality is almost nonexistent until age 45, when mortality rates increase with each subsequent decade (Figure 11). The highest rates of prostate cancer deaths occur among African American males in every age group.

### *Prostate Cancer Mortality by Regional Councils of Government, 1990–1999*

Several regional differences are apparent when comparing prostate cancer mortality rates by COG with the rest of the state. For all races combined, statistically significantly increased prostate cancer mortality occurred in the Houston-Galveston (16) COG. Significantly lower prostate cancer mortality occurred in the South Texas (19), Lower Rio Grande Valley (21) and Middle Rio Grande (24) COGs (Figure 12).

When comparing prostate cancer mortality among non-Hispanic whites by COG, there were no regions with statistically significantly higher prostate cancer mortality rates compared to Texas non-Hispanic whites. The Lower Rio Grande Valley (21) COG experienced significantly lower prostate cancer mortality (Figure 13).

Among Hispanics, the Rio Grande (8) COG had significantly higher

prostate cancer mortality compared to Texas Hispanics. The Concho Valley (10) COG had significantly lower Hispanic prostate cancer mortality (Figure 14).

For African Americans in the various COGs, there were no statistically significant differences in prostate cancer mortality compared to Texas African Americans (Figure 15).

### *Prostate Cancer Mortality Compared with California and the U.S. (Texas, 1990–1999; California, 1994–1998; U.S., Surveillance Epidemiology and End Results (SEER), 1990–1998)*

Prostate cancer mortality rates were similar in Texas non-Hispanic whites and Hispanics as compared to U.S. SEER males but slightly higher when compared to California males. Texas and U.S. SEER African American males experienced higher prostate cancer mortality compared to California (Figure 16). Compared to California, Texas and U.S. SEER prostate cancer mortality was higher for all races combined. Texas non-Hispanic whites, African Americans, as well as all races combined, experienced statistically significantly higher prostate cancer mortality than California males (Table 4).

### *Prostate Cancer Mortality Trends in Texas by Race/Ethnicity, 1990–1999*

Figure 17 presents trends in prostate cancer mortality rates by race/ethnicity over the ten-year period 1990–1999. Since 1990, prostate cancer rates

decreased for Texas non-Hispanic whites, African Americans, Hispanics, and for all races combined. For non-Hispanic white males and all races combined, prostate cancer incidence decreased 2% annually and was statistically significant ( $p < 0.05$ ). However, mortality rates decreased by less than 1% for African American and Hispanic males.

The more sizeable decrease in the mortality rate for non-Hispanic white males combined probably reflects improvements in the detection of prostate cancer following the introduction and widespread use of the prostate specific antigen (PSA) test in the late 1980s. However, given the much smaller decrease in mortality for African American and Hispanic men, increased screening efforts do not appear to be benefiting these two racial/ethnic subgroups to the same extent as non-Hispanic white males.

*Relative Risk of Being Diagnosed with Prostate Cancer Compared to the Relative Risk of Dying from Prostate Cancer*

Prostate cancer rates in Texas African Americans and Hispanics were compared with rates for non-Hispanic whites, resulting in a relative risk measure. The relative risk of being diagnosed with or dying from prostate cancer in Texas African Americans and Hispanics compared with Texas non-Hispanic whites is shown in Figure 18.

Texas African American males had statistically significantly higher prostate cancer incidence and mortality rates than Texas non-Hispanic white males. However, Texas Hispanic males have consistently lower incidence and mortality rates than Texas non-Hispanic white males.

The reasons for the significantly higher rates of prostate cancer in African American males compared with non-Hispanic white males are unknown. However, it is particularly noteworthy that while African American prostate cancer incidence is 40% higher than non-Hispanic white males, prostate cancer mortality is dramatically higher at 130%. This disparity in the incidence and mortality rates could be due to a variety of factors, such as later diagnosis of prostate cancer, less timely and appropriate treatment, and overall health. Some studies have even suggested that prostate cancer is more aggressive in African Americans than other races.<sup>5</sup>

***African Americans had statistically significantly higher prostate cancer incidence and mortality rates than Non-Hispanic Whites.***



***Hispanics had statistically significantly lower prostate cancer incidence and mortality rates than Non-Hispanic Whites.***



*Stage of disease at diagnosis is an important factor in prostate cancer incidence and mortality.*



*Knowledge of prostate cancer risk factors is varied by race/ethnicity.*



### *Stage of Disease at Diagnosis by Race/Ethnicity, 1995-1998*

Staging denotes the physical characteristics of malignant tumors, particularly size and the degree of growth and spread. In prostate cancer, as in most cancers, the stage at diagnosis determines treatment options as well as provides an estimate of prognosis. While many different kinds of detailed staging systems have been developed for different kinds of cancer, the basic classifications are very similar. In prostate cancer, tumors are classified in the following three categories:

**Localized** – tumor is entirely confined to the prostate gland

**Regional** – tumor has penetrated the capsule that surrounds the prostate gland and has extended directly to adjacent organs, tissues, or lymph nodes

**Distant** – tumor has spread to distant organs or lymph nodes, a process known as metastasis

As the stage at diagnosis moves across the categories into more advanced or extensive stages, the chance of cure decreases. African-American males in Texas had the highest percentage of cases diagnosed at the distant stage (9.3%), which is two times that of non-Hispanic whites (4.2%) (see Figure 19). This likely contributes to higher mortality from prostate cancer in African American men.

African Americans and Hispanics had very similar percentages in reference to diagnosis stage, yet

the mortality rate for African-Americans with prostate cancer was over three times that of Hispanics. The stage at diagnosis for African Americans and Hispanics compared to non-Hispanic whites was statistically significantly different at the  $p < 0.001$  level. However, it is important to note that over 20% of the prostate cancer cases were unstaged in each of the racial/ethnic groups.

### *Knowledge of Prostate Cancer Risk Factors and Prostate Cancer Screening by Race/Ethnicity*

In 2000, the Texas Department of Health, Behavioral Risk Factor Surveillance System (BRFSS) Program developed a supplemental prostate cancer survey for Texas men age 40 and over.<sup>6</sup> Race/ethnic groups included non-Hispanic whites, African Americans and Hispanics.

The knowledge regarding risk factors for prostate cancer varied by the different race/ethnic groups. In this survey, 44% of the men knew that race is a risk factor for prostate cancer. However, African Americans, the race/ethnic group at highest risk, had the least knowledge of this risk (41%), compared with Hispanic men who had the greatest knowledge (54%).

Only 52% of African American men knew that family history is a risk factor, compared to 78% of white men and 60% of Hispanic men. When men were asked about their self-perception of risk, only 11% of African Americans perceived themselves as being at high risk. This result is not only

counter to what is known about African American prostate cancer risk, but different from the results of the general question about race as a risk factor (41% identification by African-Americans). Comparatively, 15% of both non-Hispanic whites and Hispanics viewed themselves as being at high risk.

When asked whether they had heard of the Prostate Specific Antigen (PSA) test, non-Hispanic white men were most knowledgeable (71%), followed by African American men (51%), then Hispanic men (37%). Of those who had heard of the PSA test, 58% of non-Hispanic whites had been told by a doctor that they should have the test, followed by 36% of Hispanics and 31% of African Americans. Again, those in the highest risk group reported the least physician counseling. Those same respondents were asked whether they had ever actually had a PSA test, and only 42% of African-American men had, compared to 46% of Hispanic and 67% of non-Hispanic white men.

The question of whether the respondent has ever discussed with his physician (or other health care provider) the risks or benefits of PSA screening for early detection of prostate cancer showed that only 35% of men reported discussing risks and benefits with a medical professional. Of those men, 41% were non-Hispanic white, 23% were African-American, and 15% were Hispanic. Finally, those who had a PSA test were asked whether their doctor (or other health care professional) discussed

the results of their last PSA test. While only 58% of Hispanic men reported discussing these results, 100% of African American men reported this feedback, as did 90% of non-Hispanic whites.

### *Prostate Cancer Risk Factors*

While the causes of prostate cancer are not yet completely understood, researchers have found several factors that are consistently associated with an increased risk of developing this disease.

**Age:** Age is the strongest risk factor for prostate cancer. Prostate cancer primarily affects men over 50 years of age. The risk of developing prostate cancer increases as a man gets older.

**Race/Ethnicity:** Prostate cancer is more common among African-American men than among non-Hispanic white men and Hispanic men. Prostate cancer is much more common in North America and Europe than in the Near East, Africa, Central America, and South America.

**Family History:** Having a father or brother diagnosed with prostate cancer doubles a man's risk of this disease. The risk is even higher for men with several affected relatives, particularly if their relatives were young at the time of diagnosis.

**Diet:** Men with a high fat diet are at increased risk for prostate cancer. Some studies suggest consuming high levels of fruits and vegetables may lower prostate cancer risk.

*A risk factor is anything that increases your chance of developing the disease.*



*Risk factors for prostate cancer include age, race/ethnicity, family history, diet, & physical activity.*



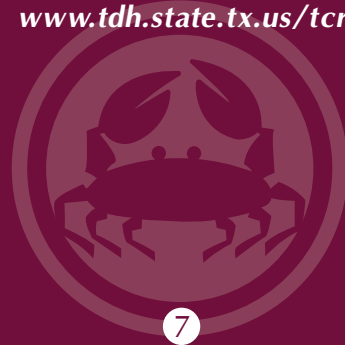
*Prostate Cancer  
remains a major  
public health  
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**Physical Activity:** Regular physical activity and maintaining a healthy weight may help reduce prostate cancer risk.

### *Summary*

In summary, prostate cancer remains a major public health problem. In Texas and the United States, prostate cancer is the most frequently diagnosed invasive cancer among men and is the second leading cause of cancer death. Prostate cancer incidence and mortality vary by age, race/ethnicity, and geographic region. Prostate cancer is primarily a disease of older men, with over 70% of men being diagnosed over age 65. Consistent with the United States, Texas African American men experienced the highest prostate cancer incidence and mortality compared with any other racial/ethnic group. African American prostate cancer incidence was 40% higher than non-Hispanic white males, while prostate cancer mortality was drastically higher at 130%. Such significant differences in the African American prostate cancer experience suggest disparities in screening and early diagnosis, timely and appropriate treatment, aggressiveness of prostate cancer in African Americans, and overall health.

Regional differences in prostate cancer incidence and mortality also occurred across the state. Hispanics in the Rio Grande (8) COG that includes El Paso, had statistically significantly higher prostate cancer incidence and mortality when compared to Texas Hispanics. For all races

combined, the Houston-Galveston (16) COG had statistically significantly higher prostate cancer incidence and mortality when compared with Texas all races combined. The reasons for these variations are not known, but may occur due to screening disparities and/or differences in reporting completeness.

### *Technical Notes*

#### *Sources of Data*

The Texas Cancer Registry (TCR) collects incident reports of neoplasms occurring among state residents, including certain benign tumors and borderline malignancies. The incidence rates in this report are for primary malignant neoplasms.

The TCR is a population-based reporting system. Texas hospitals and cancer treatment centers are the primary sources of case reporting. Additionally, information is sought for Texas residents who are diagnosed and treated at facilities outside of Texas. The data used in this report are primarily abstracted from medical records and pathology reports.

The completeness of the 1995-1998 data was evaluated by applying California's age- and race-specific cancer incidence rates to the Texas population in order to generate expected numbers of cases. Based on these calculations, the 1995-1998 data presented here are estimated to be 99% complete.

Cancer mortality data were extracted from electronic files

provided by the Texas Department of Health, Bureau of Vital Statistics. These files contained demographic and cause of death information for all deaths occurring among residents of Texas.

### *Confidentiality*

Maintaining the confidentiality of persons whose cancers are reported to the TCR is mandated by law and is the highest priority of the Registry in all aspects of operations. No data presented in this report are intended to be used to identify individuals who have been diagnosed with cancer.

### *Primary Site Codes*

Primary site and histologic type were coded for each cancer incident case using the International Classification of Diseases for Oncology (ICD-O, version 2).<sup>7</sup> The ICD-O codes corresponding to the prostate cancer site category in this report are C619 (excluding morphologic types 9050: 9055, 9140, 9590: 9989).

For 1990–1998 cancer mortality data, the prostate cancer site presented in this report corresponds to site grouping (185) used by the National Cancer Institute (NCI) for the 9th Revision of the International Classification of Diseases (ICD-9) National Center for Health Statistics mortality data.<sup>8</sup> For 1999 cancer mortality data, the prostate cancer site presented corresponds to site grouping (C61) used by the 10th Revision of the International Classification of Diseases (ICD-10)

National Center for Health Statistics.<sup>9</sup>


### *Data Management*

Data on incident cancers are reported to the Texas Cancer Registry in accordance with the Texas Cancer Incidence Reporting Act (Chapter 82, Health and Safety Code). Standard data items are requested on the Confidential Cancer Incidence Reporting Form or in electronic format. These data are entered into a cancer incident database after being checked for completeness and quality. Multiple reports for the same individual are consolidated to assure the most complete and correct information possible.

### *Race and Ethnicity of Cancer Cases*

The race/ethnic groups used in this report for incidence data include the following mutually-exclusive categories: non-Hispanic white, African American, and Hispanic. The Hispanic designation can therefore be of any race, but from 1995–1998, 98.9% of cancers in Hispanics were of the white race. The race and ethnicity of each cancer patient was taken from the medical records and classified according to the categories defined in the North American Association of Central Cancer Registries (NAACCR) coding manual.<sup>10</sup>





The race/ethnic groups used in this report for 1990–1998 mortality data include the following mutually-exclusive categories: non-Hispanic white, African American, and Hispanic. However, for 1999 mortality data, Hispanic African Americans are included with Hispanics, rather than with African Americans as in previous years of mortality data. In 1999, 99.5% of cancers in Hispanics were of the white race.

The classification of Hispanics is based on the death certificate's Hispanic origin question, which is answered by the informant. The informant may be next of kin, a friend, funeral director, attending physician, medical examiner, justice of the peace, or other source. This method is consistent with the classification schema used by other state programs. For mortality reports prior to 1992, the Hispanic data were based on Spanish surname, as determined by the "Generally Useful Ethnic Search System" (GUESS).<sup>11</sup> Compared to the surname method, it is estimated that classification by origin will increase the Hispanic number of deaths, resulting in slightly higher mortality rates.

Persons in racial ethnic subgroups other than non-Hispanic white, African American, or Hispanic (i.e., American Indians, Asians, etc.), as well persons of unknown race are not included in any of the race/ethnic-specific incidence and mortality rates, but are included in the total for all races. Persons of other racial ethnic subgroups and unknown race make up only 1.5% of the total number of prostate

cancer cases from 1995–1998 and 0.3% of the total number of prostate cancer deaths from 1990–1999.

### *Population Data*

Estimates of the population used for the calculation of rates were obtained from the Texas Department of Health, Office of Policy and Planning. For 1995–1998 and 1990–1999, the largest group is the non-Hispanic white population with 58% of the state population. Texas Hispanics comprise 28.0% of the total population, African Americans represent 11% of the total population and there were 2% Other Races.

### *Cancer Incidence Data Quality*

Numerous quality assurance procedures are applied to the data based on the SEER Program procedures and NAACCR standards. The quality control procedures include both internal and external processes to insure the reliability, completeness, consistency and comparability of TCR data. The internal process included a review of the hard copy abstract for multiple primaries, duplicate records, and valid codes for all fields.

Both hard copy and computerized data were scrutinized for identification of: 1) possible duplicates of existing records, 2) unacceptable codes for any field, or inter-field inconsistencies, and 3) invalid or unusual site/sex, age/site, age / morphology or site/morphology combinations. Inconsistencies in date of birth,

race, ethnicity, sex, county of residence, date of diagnosis, site and histologic type were rectified. Multiple primaries for an individual were identified among the various reports during the editing process. Information on the same primary from duplicate reports was consolidated and checked for consistency and legitimate codes.

External procedures include hospital training, on-site case-finding studies, and reabstracting studies. Cancer death certificate files were also matched against reported incident cases for an additional check of reporting completeness. Reabstracting studies were carried out to reabstract a sample of reported cases, and discrepancies are identified and used to assess the quality of reporting.

The percentage of cases microscopically confirmed measures the quality of the diagnostic information on which the assignment of primary site is based. A case is microscopically confirmed if the diagnosis is based on autopsy, histology, cytology, or hematology findings. Of the total 1995–1998 prostate cancer cases, 93 percent were microscopically confirmed.

To identify any cancer cases not reported to the TCR, information on all death certificates with the underlying cause of death due to malignant neoplasm was obtained from the Bureau of Vital Statistics, Texas Department of Health. Institutions listed on the death certificates as place of death were queried for additional cancer case information. Missed cases not identified from any institution were

added to the cancer database. Cases for which the only available information is the death certificate, classified as "death certificate only" cases, were included in this report. The date of death was considered to be the date of diagnosis for these cases. From 1995–1998, 2.5% of prostate cancer cases were death certificate only cases.

### *Data Analysis*

In this report, average annual incidence and mortality rates were age-adjusted using the direct method. Age adjustment eliminates the effects of differences in the age structure between populations, and allows direct comparison of incidence and mortality rates for these populations. Direct standardization weights the age specific rates for a given sex, race/ethnicity or geographic area by the age distribution of the standard population. The 1970 United States standard million population (Table 5) was used as the standard for all calculations.<sup>12</sup>

The incidence and mortality rates and frequencies used in this report were calculated using SEER\*Stat software (ver. 3.0). This software was developed by SEER to analyze population-based cancer registry data, and provides the age-adjusted incidence and mortality rates for the standard set of cancer sites and site groups recognized by the SEER program. Information regarding availability and use of this software can be found on the SEER web site: [www-seer.ims.nci.nih.gov/scientificsystems](http://www-seer.ims.nci.nih.gov/scientificsystems).



The rate estimates were made using 1995-1998 statewide average annual age-adjusted incidence rates, and 1990-1999 statewide average annual age-adjusted mortality rates.

### *Comparisons of Cancer Rates*

Figure 18 in this report makes comparisons of the relative risk of being diagnosed with or dying from prostate cancer in Texas African-Americans and Hispanics compared with Texas non-Hispanic whites. This is calculated by dividing the age-adjusted rate in the relevant African American or Hispanic population by the age-adjusted rate in the corresponding non-Hispanic white population. A relative risk of 1.0 therefore means the incidence or mortality from cancer is the same in each group. If the relative risk is greater than 1.0, the cancer incidence or mortality rate is higher in the group being studied (African Americans or Hispanics) than in the comparison population (non-Hispanic white). If the relative risk is lower than 1.0 the cancer incidence or mortality rates are lower in the group being studied (African Americans or Hispanics) than in the comparison population (non-Hispanic white).

The differences between these rates were then tested for statistical significance by calculating the 95% confidence interval for the ratio of the rate in one group compared with the other, and determining whether that confidence interval excluded 1.0. The 95% confidence intervals were obtained by the logarithmic transformation of the pooled rate ratio.<sup>13</sup>

Readers are cautioned that statistically significant variation in rates can occur for a variety of unknown factors, and additional assessment of any significant differences may be needed to determine which differences represent true public health problems. Statistical significance also does not reflect the overall importance of the result (that is, non-significant differences may be important, and statistically significant differences may be unimportant).

### *Mapping*

The age-adjusted all races and race/ethnicity-specific prostate cancer rates were calculated for each COG and compared with the respective age-adjusted race/ethnicity-specific prostate rate for the total state. The ratio of these rates was then tested for statistical significance by calculation of the 95% confidence intervals.

Maps were then color-coded by COG to indicate statistically significant excesses and deficits. COGs with less than 20 cases or deaths for the respective time periods and race/ethnicity were excluded from mapping.

### *Trend Analysis*

The Estimated Annual Percent Change (EAPC) represents the average percent increase or decrease in cancer rates per year over a specified period of time. The EAPC is calculated by fitting a linear regression to the natural logarithm of the annual rates, using calendar year as a predictor variable (formula:  $\ln(r) = m(\text{year}) +$

b). From the slope of the regression line,  $m$ , EAPC is calculated as:  
$$EAPC = 100 \times (e^m - 1).$$

Testing the hypothesis that the EAPC is equal to zero is equivalent to testing the hypothesis that the slope of the line in the regression is equal to zero. Statistical significance was set at  $\alpha = 0.05$ , thus a trend in rates was considered statistically significant if there was less than a five percent chance that the difference was the result of random variation. The EAPC assumes that the cancer rate is changing at a constant rate

over the interval examined.<sup>14</sup>

Asterisks indicate that the change is statistically significant ( $p < 0.05$ ). Trends should be interpreted with caution because of the relatively short time period for which data are available. ©

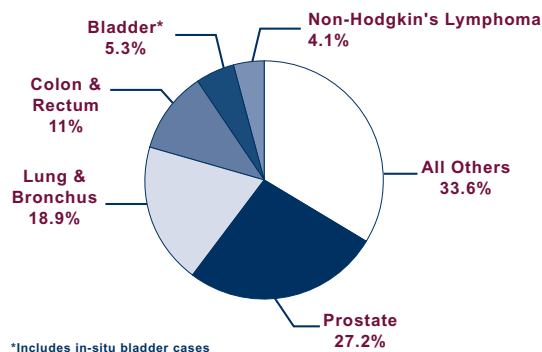
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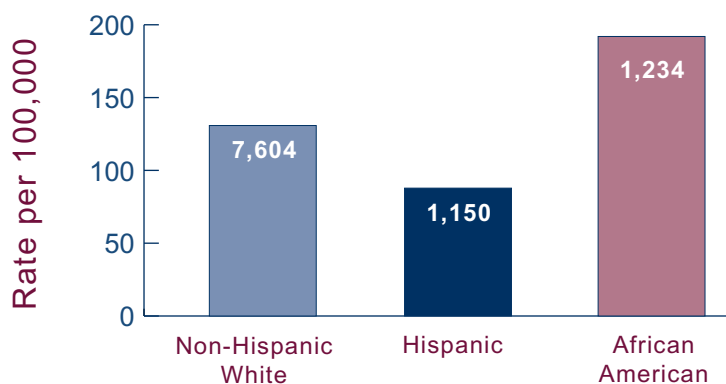
**Figure 1**

**Percent Distribution of Average Annual Cancer Cases by Site, Texas, 1995-1998**



**Figure 2**

**Prostate Cancer Incidence Rates and Average Annual Cases by Race/Ethnicity, Texas, 1995-1998**



Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard. Average annual incidence counts are rounded to the nearest whole.

**Table 1**

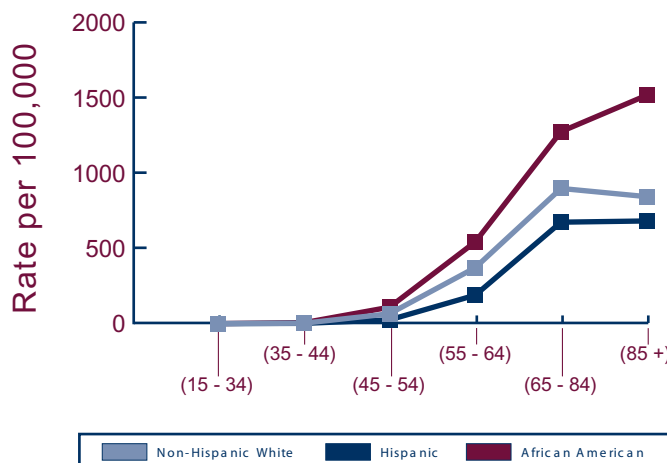
**Prostate Cancer Average Annual Cases and Percentage of Total New Cancers by Age of Diagnosis, Texas, 1995-1998**

Age	No. Cases	% Total New Cases
15 - 34	1	0.0%
35 - 44	39	0.4%
45 - 54	628	6.2%
55 - 64	2,345	23.1%
65 - 84	6,583	65.0%
85+	537	5.3%

Average annual incidence counts are rounded to the nearest whole.

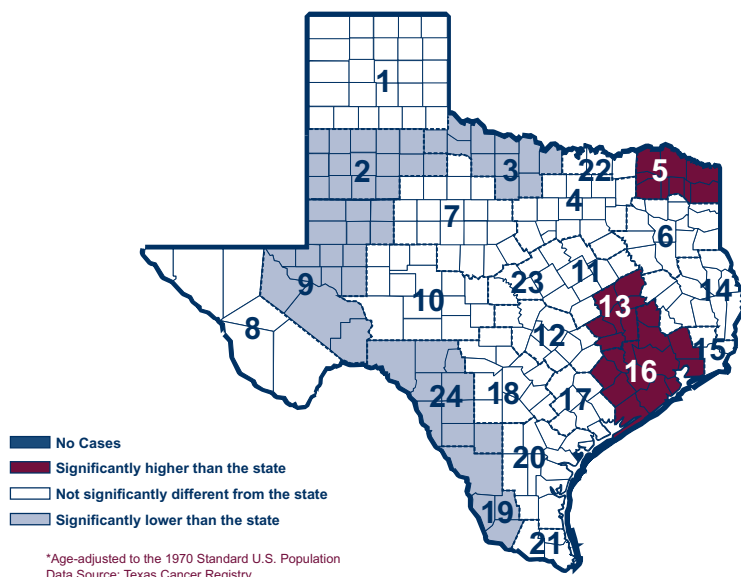
**Figure 3**

**Age-Specific Prostate Cancer Incidence Rates by Race/Ethnicity, Texas, 1995-1998**



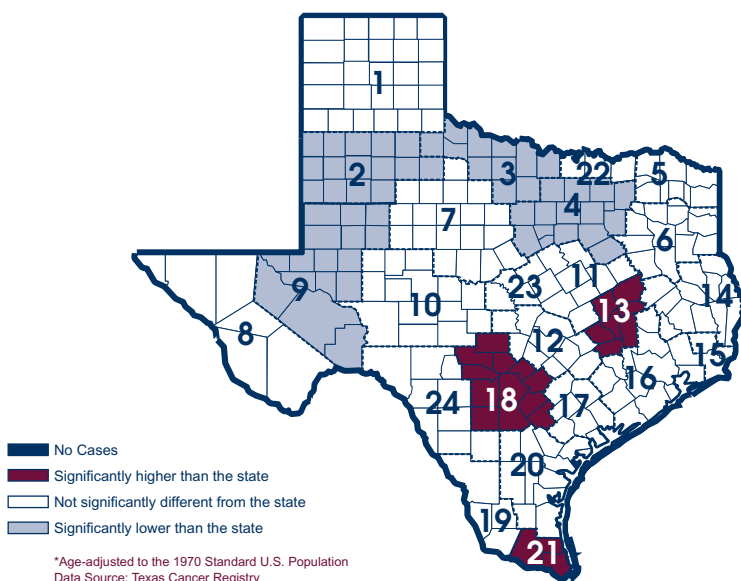
Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard.

Rates are not calculated where the count is equal to or less than 5 cases, due to instability of the resulting rate.



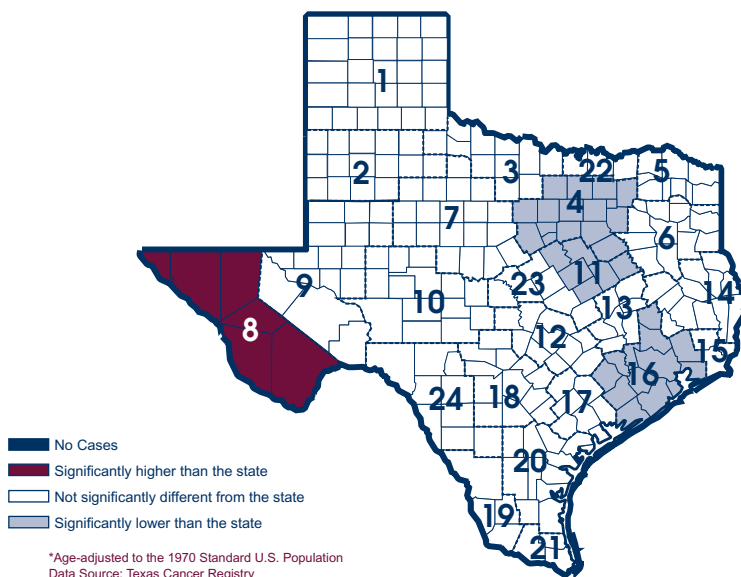
**Figure 4**

*Comparison of Prostate Cancer Incidence Rates\* by COG, All Races, Texas, 1995-1998*



**Figure 5**

*Comparison of Prostate Cancer Incidence Rates\* by COG, Non-Hispanic Whites, Texas, 1995-1998*



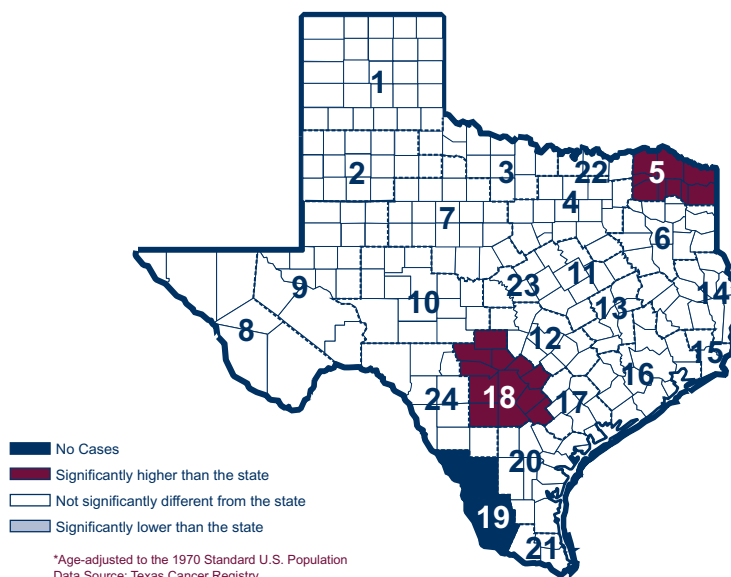
**Figure 6**

*Comparison of Prostate Cancer Incidence Rates\* by COG, Hispanic, Texas, 1995-1998*



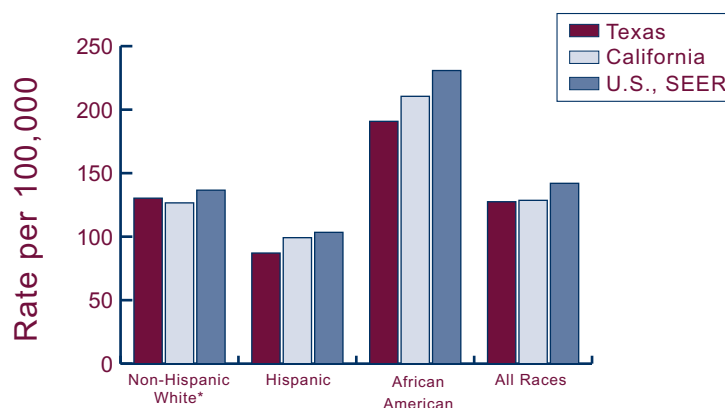
**Figure 7**

**Comparison of Prostate Cancer Incidence Rates\* by COG, African American, Texas, 1995-1998**



**Figure 8**

**Prostate Cancer Incidence Rates (1995-1998) Compared with California (1994-1998) and the U.S., SEER (1994-1998) by Race/Ethnicity**



\*SEER category "White."  
Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard.  
Source: Texas Cancer Registry, Cancer in California, 1988-1998; SEER, Cancer Statistics Review, 1973-1998; SEER Program Public-Use Data (1973 - 1998).

**Table 2**

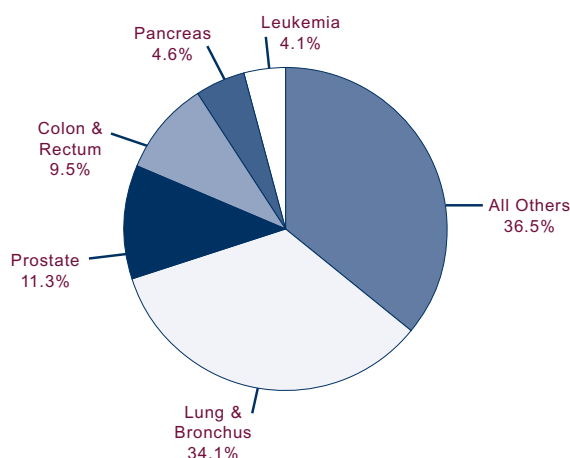
**Prostate Cancer Incidence rate Comparisons of Texas (1995-1998) with California (1994-1998) by Race/Ethnicity**

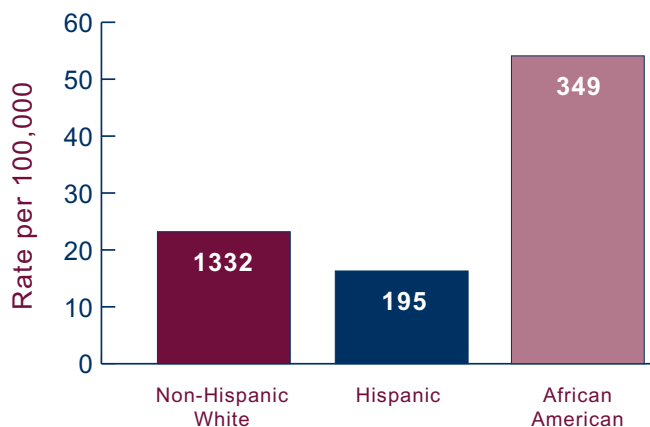
	Rate Ratio	95% CI
Non-Hispanic White	1.03 *	1.02, 1.04
Hispanic	0.88 *	0.85, 0.91
African American	0.91 *	0.87, 0.94
All Races	0.99	0.98, 1.00

\*Statistically significant at  $p < 0.05$ .

**Figure 9**

**Percent Distribution of Average Annual Male Cancer Deaths by Site, Texas, 1990-1999**

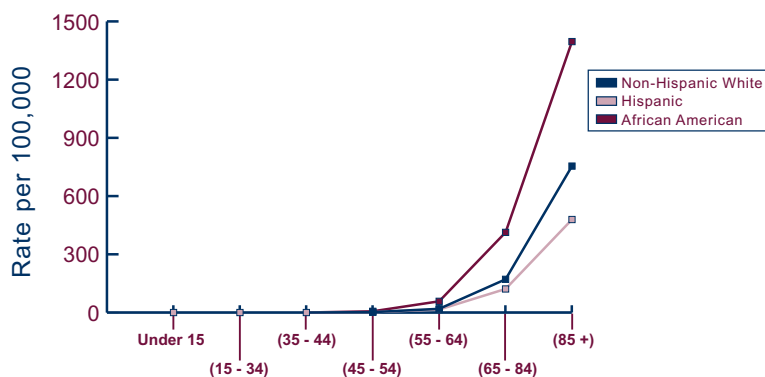




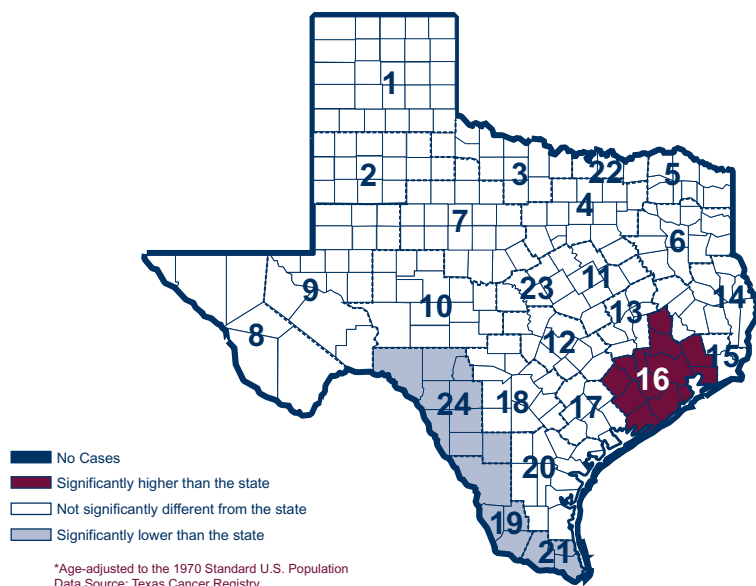
Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard. Average annual mortality counts are rounded to the nearest whole.

Age	No. Deaths	% Total Deaths
15 - 34	0	0.0%
35 - 44	1	0.0%
45 - 54	22	1.2%
55 - 64	140	7.4%
65 - 84	1,287	68.4%
85+	431	23.0%

Average annual mortality counts are rounded to the nearest whole.



Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard. Source: Texas Cancer Registry



**Figure 10**

**Prostate Cancer Mortality Rates and Average Annual Deaths by Race/Ethnicity, Texas, 1990-1999**

**Table 3**

**Prostate Cancer Average Annual Deaths and Percentage of Total Cancer Deaths by Age of Death, Texas, 1990-1999**

**Figure 11**

**Age-Specific Prostate Cancer Mortality Rates by Race/Ethnicity, Texas, 1990-1999**

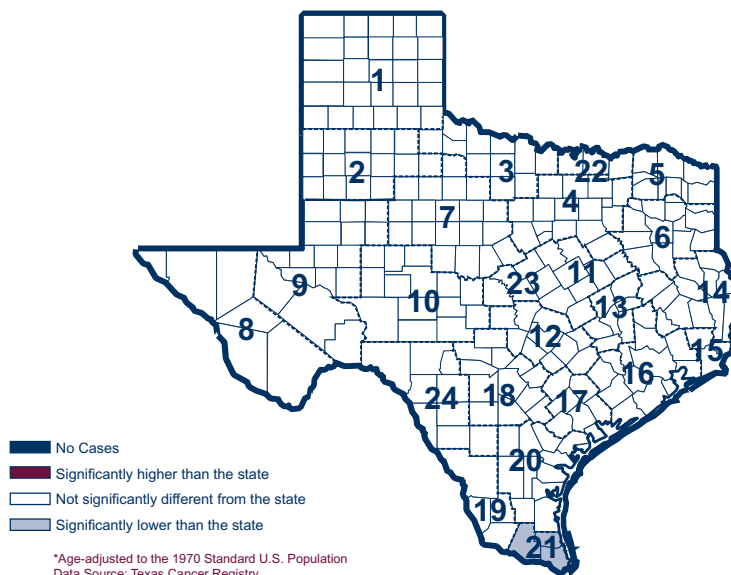
**Figure 12**

**Comparison of Prostate Cancer Mortality Rates\* by COG, All Races, Texas, 1990-1999**



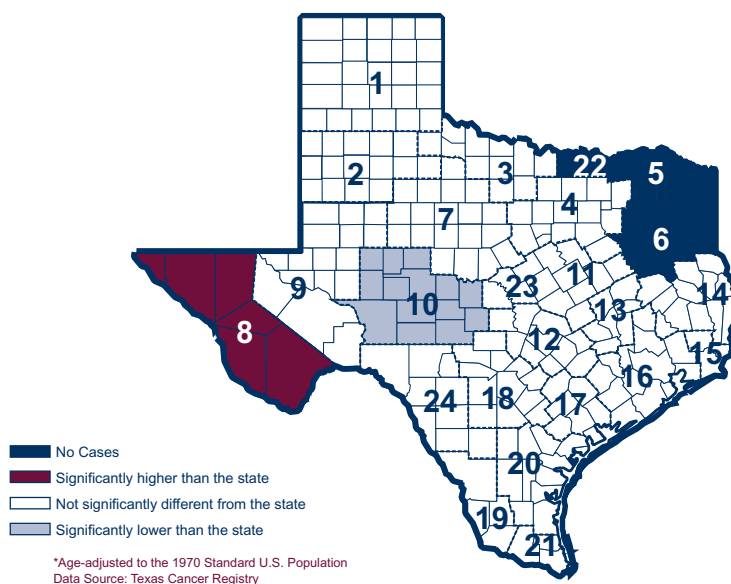
**Figure 13**

*Comparison of Prostate Cancer Mortality Rates\* by COG, Non-Hispanic White, Texas, 1990-1999*



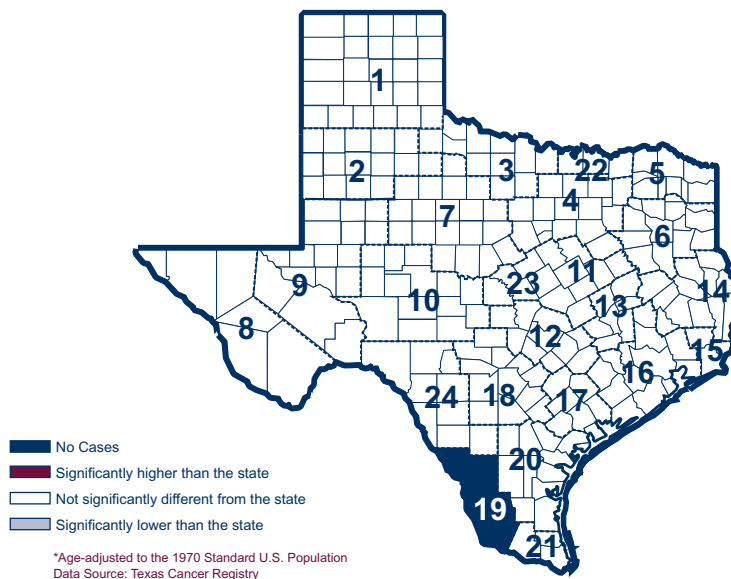
**Figure 14**

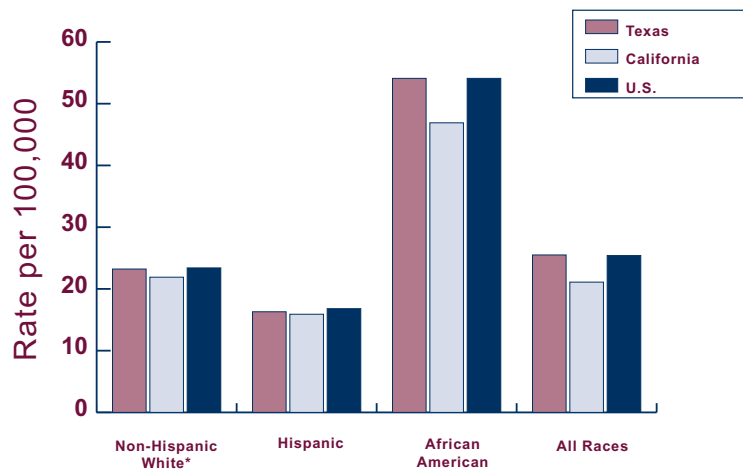
*Comparison of Prostate Cancer Mortality Rates\* by COG, Hispanic, Texas, 1990-1999*



**Figure 15**

*Comparison of Prostate Cancer Mortality Rates\* by COG, African American, Texas, 1990-1999*

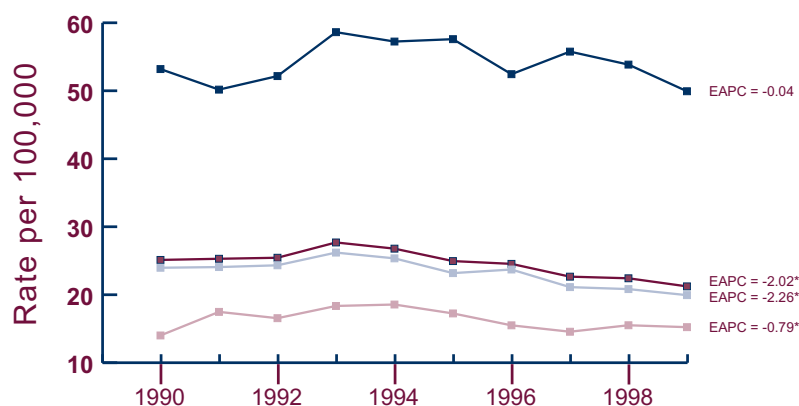




\*SEER category "White".  
 Rates are average annual rates per 100,000 population, age-adjusted to the 1970 U.S. Standard.  
 Source : Bureau of Vital Statistics; Cancer in California, 1988 - 1998; SEER Cancer Statistics Review, 1973 - 1998.

**Figure 16**

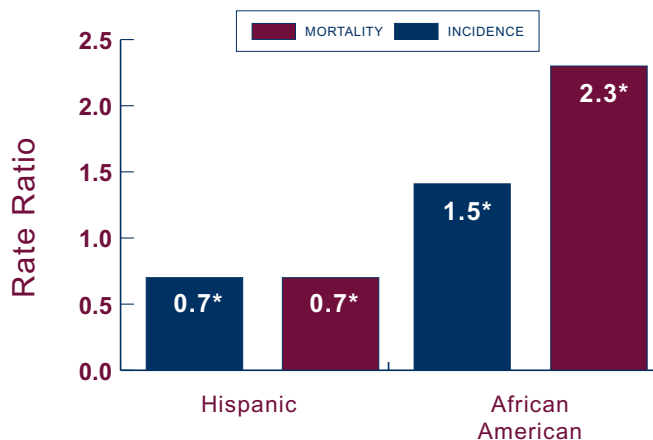
*Texas Prostate Cancer Mortality Rates (1990-1999) Compared with California (1994-1998) and the U.S., SEER (1990-1998) by Race/Ethnicity*



\*Estimated annual percent change (EAPC) is statistically significant at  $p < 0.05$ .  
 Rates are per 100,000 and age-adjusted to the 1970 U.S. standard.

**Figure 17**

*Trends in Age-Adjusted Prostate Cancer Mortality Rates by Race/Ethnicity, Texas 1990-1999*



\*Rate in Hispanic and African American males is statistically significantly higher (if  $>1$ ), or lower (if  $<1$ ) than rate in non-Hispanic white males at  $p < 0.05$ .

**Figure 18**

*Relative Risk of Prostate Cancer (1995-1997) and Dying from Prostate Cancer (1990-1999) in Hispanics and African Americans Compared to Non-Hispanic White Males, Texas*

**Table 4**

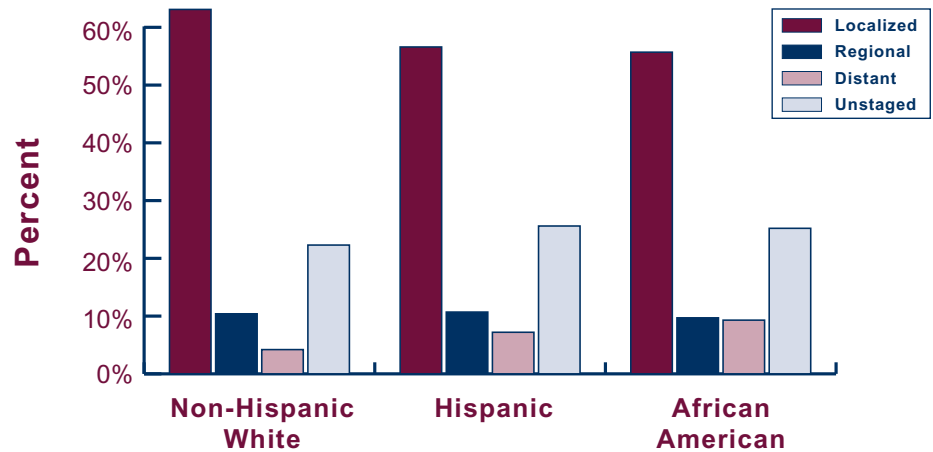
*Prostate Cancer  
Mortality Rate  
Comparisons, Texas,  
1990-1999, with  
California, 1994-1998,  
by Race/Ethnicity*

	Rate Ratio	95% CI
Non-Hispanic White	1.06 *	1.03, 1.09
Hispanic	1.02	0.96, 1.10
African American	1.15 *	1.09, 1.22
All Races	1.16 *	1.14, 1.19

\*Statistically Significant at  $p < 0.05$ .

**Figure 19**

*Percent Distribution of  
Prostate Cancer Stage  
at Diagnosis by  
Race/Ethnicity, Texas,  
1995-1997*



Percentages are rounded to the nearest whole.

**Table 5**

*United States 1970  
Standard Million  
Population by Age*

Age	Population
All Ages	1,000,000
0-4	84,416
5-9	98,204
10-14	102,304
15-19	93,845
20-24	80,561
25-29	66,320
30-34	56,249
35-39	54,656
40-44	58,958
45-49	59,622
50-54	54,643
55-59	49,077
60-64	42,403
65-69	34,406
70-74	26,789
75-79	18,871
80-84	11,241
85+	7,435

Source: U.S. Bureau of the Census, Census of Population, 1970.

